In the Specification

Please amend the specification as set forth in the following paragraphs.

On page 1, replace the paragraph starting at line 5 with the following paragraph:

This application is related to U. S. Patent ~~patent application serial~~ No. <u>6,289,021</u> ~~09/009,703, filed on January 20, 1998,~~ which is ~~pending and is~~ incorporated herein by reference in its entirety. This application is also related to and incorporates U.S. Patent No. 5,996,020 herein by reference in its entirety.

Also on page 1, replace the paragraph starting at line 12 with the following paragraph:

1. United States patent application serial no. ~~xx/xxx,xxx~~ <u>09/693,359</u> entitled, "Scaleable ~~Multipath~~ <u>Multi-Path</u> Wormhole Interconnect", ~~<atty. docket no.: M-8175 US>~~ naming John Hesse as inventor and filed on even date herewith;

2. United States patent application serial no. ~~xx/xxx,xxx~~ <u>09/693,603</u> entitled, "Scaleable Interconnect Structure for Parallel Computing and Parallel Memory Access", ~~<atty. docket no.: M-8650 US>~~ naming John Hesse and Coke Reed as inventors and filed on even date herewith;

3. United States patent ~~application serial~~ no. ~~xx/xxx,xxx~~ <u>6,687,253</u> entitled, "Scaleable Wormhole Routing Concentrator", ~~<atty. docket no.: M 9458 US>~~ naming Coke Reed and John Hesse as inventors and filed on even date herewith;

4. United States patent application serial no. ~~xx/xxx,xxx~~ entitled, "Scaleable Apparatus and Method for Increasing Throughput In Multiple Level Minimum Logic Networks Using a Plurality of Control Lines", <atty. docket no.: F.11146

US > naming John Hesse and Coke Reed as inventors and filed on even date herewith.

On Page 4, paragraph 2, beginning on line 4, please replace the paragraph with the following paragraph:

FIGUREs 3A, 3B, and 3C depict third and fourth examples of interconnect structures that support quality of service handling of a type discussed in U. S. patent ~~application serial~~ No. ~~09/009,703~~ 6,289,021, and can be modified to support new kinds of quality of service described hereinafter.

On Page 5, paragraph 3, please replace the paragraph with the following paragraph:

In U.S. Patent number 5,996,020 the terms "cylinder" and "angle" are used as a reference to position. The terms are analogous to "level" and "column," respectively, used in U. S. patent ~~application serial~~ No. ~~09/009,703~~ 6,289,021, and in the present description.

On Page 5, paragraph 4, please replace the paragraph with the following paragraph:

Referring also to FIGURE 1B, the interconnect structure 102 includes nodes A and B on one cylinder, and nodes C and D on another cylinder. Nodes A and C are at the same angle. Nodes B and D are at the same angle that is different from the angle of nodes A and C. Node A is capable of sending data packets to node B on path 110 and to node D on path ~~108~~ 106. Node C can send control signals to node A on path ~~108~~ 106 to enforce the priority for node C to send data packets to node D, over the priority for node A to send data packets to node D. In the example of the interconnect structure ~~100~~ 102, node A can send data packets directly to node D without the packets passing through another node.

On Page 6, paragraph 3, please replace the paragraph with the following paragraph:

FIGURES 3A and **3B** depict third and fourth examples of interconnect structures that support QOS handling. **FIGURE 3A** depicts a portion of a network structure taught in U. S. patent ~~application serial~~ No. ~~09/009,703~~ 6,289,021 and U. S. patent application serial no. ~~xx/xxx,xxx~~ 09/693,359, ~~<atty. docket no.: M-8175 US>~~, which has a more complex arrangement of nodes and interconnections, for the propose of greater transmission efficiency. **FIGURE 3B** depicts a concentrator taught in U. S. patent ~~application serial~~ no. xx/xxx,xxx, 6,687,253 ~~<atty. docket no.: M-9458 US>~~.

On Page 7, paragraph 3, please replace the paragraph with the following paragraph:

In one category of embodiments, path **306** connecting nodes A and X to node D connects diagonally as shown in structure ~~302~~ 310 of **FIGURE 3C**. In another category of embodiments, the connections from nodes A and X to node D pass through node C as shown in structure **302** of **FIGURE 3B**.

On Page 8, lines 27-31, please replace the paragraph as follows:

Referring to any of **FIGUREs 3A**, **3B**, and **3C**, node D on level N receives data from one node C on level N and from two nodes A and X on level N+1. A method for using quality of service (QOS) information stored in the header is described in U. S. patent application serial no. ~~xx/xxx,xxx~~ 09/693,359 ~~, <atty. docket no.: M-8175 US>~~. Node C always has priority over node A and node X to send packets to node D.

On Page 9, lines 1-13, please replace the paragraph as follows:

One aspect of the interconnect structures described herein and in the patents and applications incorporated by reference is priority to resolve conflicts or collisions of messages that attempt to pass through the same node or cell simultaneously. Priority is resolved based on the relative position of nodes in the hierarchy. Priority based on position
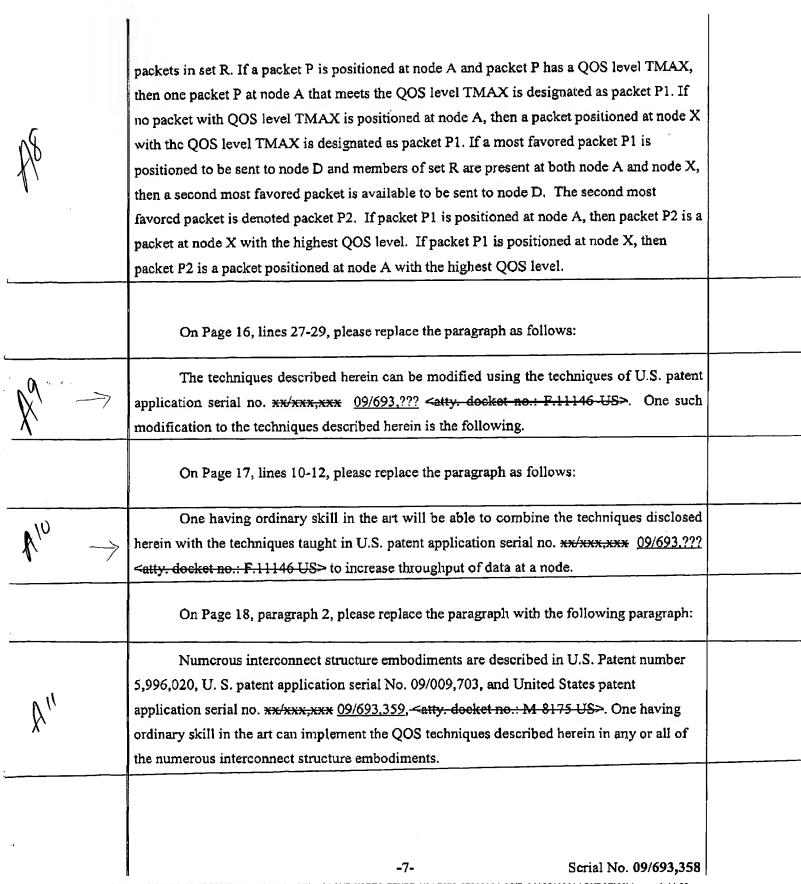
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gives node A priority over node X to send packets to node D unless a higher priority packet PX at node X is targeted for node D and a lower priority packet PA at node A is targeted for node D. In this condition, packet PX is sent to node D and the packet PA is deflected to node B as described in U. S. patent application serial no. ~~xx/xxx,xxx~~ 09/693,359 ~~, atty. docket no.: M-8175 US~~. The reference also discloses similar techniques for nodes that are connected into multiple cells. In the disclosure herein, quality of service processing is extended by additional techniques assuring that high QOS messages move more rapidly through the interconnect structure than lower QOS messages.

On Page 13, paragraph 2, please replace the paragraph with the following paragraph:

The received packets arrive from a node or nodes outside the group illustrated in **FIGURE 4B**. The simultaneous or near simultaneous timing is discussed extensively in U.S. Patent number 5,996,020, U. S. patent ~~application serial~~ No. ~~09/009,703~~ 6,289,021, and United States patent application serial no. ~~xx/xxx,xxx~~ 09/693,359, ~~atty. docket no.: M-8175 US~~. Following the particular time period for the reception of packets by node A and node X, node A sends a control signal S2 to node X, and node X sends a control signal S3 to node A.

On Page 15, please replace the paragraph beginning on line 22 with the following paragraph:

Referring to **FIGURE 4B**, the minimum QOS for changing levels from node A to node D is set equal to the minimum QOS for changing levels from node X to node D, expressed mathematically by the equation $T_0(X,D) = T_0(A,D)$. A packet P at node A or node X is a candidate to be sent to node D if: 1) the level of QOS of packet P is at least $T_0(A,D)$; and 2) a path exists through node D to an acceptable output port for packet P. If any candidate packets are present at node A or node X for sending to node D, then a message set R can be defined as the set of packets that are candidates for sending from the node A or the node X to the node D. If the set R has ~~any~~ many entries, then a most favored packet of set R to be sent to node D is denoted packet P1. TMAX designates the highest QOS level of all

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packets in set R. If a packet P is positioned at node A and packet P has a QOS level TMAX, then one packet P at node A that meets the QOS level TMAX is designated as packet P1. If no packet with QOS level TMAX is positioned at node A, then a packet positioned at node X with the QOS level TMAX is designated as packet P1. If a most favored packet P1 is positioned to be sent to node D and members of set R are present at both node A and node X, then a second most favored packet is available to be sent to node D. The second most favored packet is denoted packet P2. If packet P1 is positioned at node A, then packet P2 is a packet at node X with the highest QOS level. If packet P1 is positioned at node X, then packet P2 is a packet positioned at node A with the highest QOS level.

On Page 16, lines 27-29, please replace the paragraph as follows:

The techniques described herein can be modified using the techniques of U.S. patent application serial no. xx/xxx,xxx 09/693,??? <atty. docket no.: F.11146 US>. One such modification to the techniques described herein is the following.

On Page 17, lines 10-12, please replace the paragraph as follows:

One having ordinary skill in the art will be able to combine the techniques disclosed herein with the techniques taught in U.S. patent application serial no. xx/xxx,xxx 09/693,??? <atty. docket no.: F.11146 US> to increase throughput of data at a node.

On Page 18, paragraph 2, please replace the paragraph with the following paragraph:

Numerous interconnect structure embodiments are described in U.S. Patent number 5,996,020, U. S. patent application serial No. 09/009,703, and United States patent application serial no. xx/xxx,xxx 09/693,359, <atty. docket no.: M 8175 US>. One having ordinary skill in the art can implement the QOS techniques described herein in any or all of the numerous interconnect structure embodiments.

On Page 18, lines 14-19, please replace the paragraph as follows:

In Summary, three examples of methods for supporting quality of service are described:

1)   A method first taught in U. S. ~~patent application serial No. 09/009,703~~ <u>Patent No. 6,289,021</u> in which nodes A and X on level N+1 contend to send a packet to a third node D on level N. Contention is first resolved by quality of service and second by position.

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